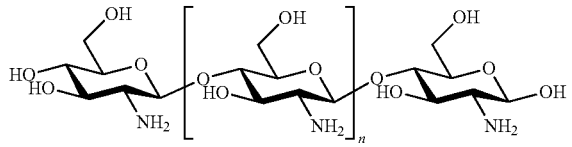
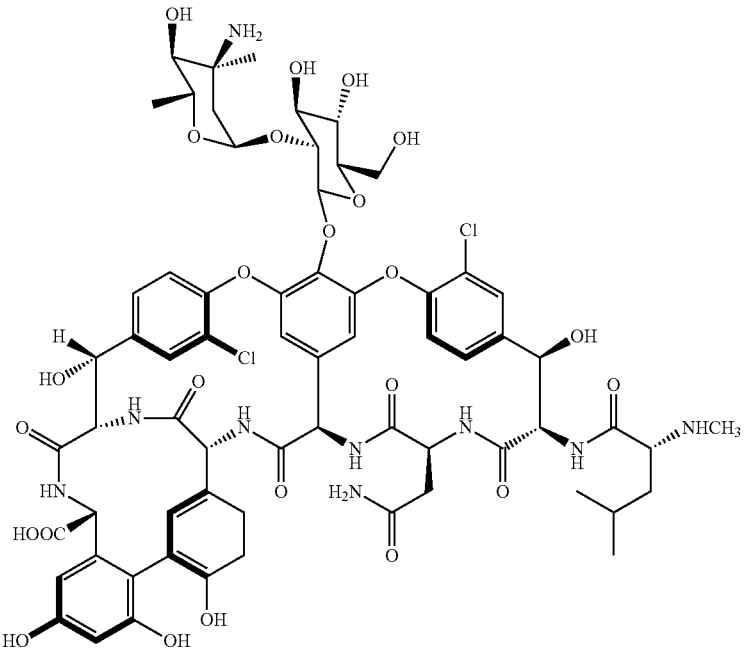
[0014] By "chitosan microbead" is meant a microscopic particle or sphere comprising cross-linked chitosan. In one embodiment, a microbead is at least about 0.001 um to about 5 mm in diameter.

[0015] By "chitosan" is meant a chitin-derived polymer that is at least 20% deacetylated. In various embodiments, chitosan is at least about 50% deacetylated. In particular embodiments, chitosan is at least about 61% or 71% deacetylated. Chitin is a linear polysaccharide consisting of (1-4)-linked 2-acetamido-2-deoxy-b-D-glucopyranose. Chitosan is a linear polysaccharide consisting of (1-4)-linked 2-amino-2-deoxy-b-D-glucopyranose. An exemplary chitosan polymer is shown by the formula below. In one embodiment, chitosan has a molecular weight of about 250 kD.

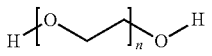


[0016] By "acid treated chitosan" is meant chitosan that is solubilized in an acidic solution.

[0017] By "vancomycin" is meant the compound (1S,2R,18R,19R,22S,25R,28R,40S)-48-{[(2S,3R,4S,5S,6R)-3-{[(2S,4S,5S,6S)-4-amino-5-hydroxy-4,6-dimethyloxan-2-yl]oxy}-4,5-dihydroxy-6-(hydroxymethyl)oxan-2-yl]oxy}-22-(carbamoylmethyl)-5,15-dichloro-2,18,32,35,37-pentahydroxy-19-[(2R)-4-methyl-2-(methylamino)pentanamido]-20,23,26,42,44-pentaoxo-7,13-dioxa-21,24,27,41,43-pentaazaoctacyclo[26.14.2.2^{3,6}.2^{14,17}.1^{8,12}.1^{29,33}.0^{10,25}.0^{34,39}]pentaconta-3,5,8(48),9,11,14,16,29(45),30,32,34,36,38,46,49-pentadecaene-40-carboxylic acid and CAS number 1404-90-6. Vanomycin is shown by the formula below.



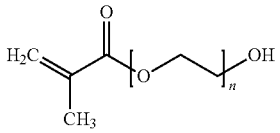
[0018] By "polyethylene glycol (PEG)" is meant an oligomer or polymer of ethylene oxide. Commercially available PEG ranges in molecular weight from 300 g/mol to 10,000,000 g/mol. An exemplary PEG is shown by the formula below.



[0019] In particular embodiments, PEG molecular weight is 6000 g/mol, 8,000 g/mol, 10,000 g/mol. The degradation profile of the chitosan/PEG composition can be tailored to the desired level by increasing or decreasing the molecular weight of the PEG. In particular, when lower molecular weight PEG is used degradation is enhanced. When higher molecular weight PEG is used degradation is decreased.

[0020] By "polyethylene dimethacrylate (PEGDMA)" is meant an oligomer or polymer of ethylene oxide with dimethacrylate to form PEGDMA. Commercially available PEGDMA ranges in molecular weight from 1 g/mol to 10,000 g/mol.

[0021] An exemplary PEGDMA is shown by the formula below:



[0022] In an embodiment, PEGDMA is polyethylene glycol dimethacrylate (PEGDMA). In particular embodiments, PEGDMA molecular weight is 100 g/mol, 200 g/mol, 300 g/mol, 400 g/mol, 500 g/mol, 600 g/mol, 700 g/mol, 800